

## **ATTACHMENT # 2 SPECIFICATIONS**

### **GENERAL DESCRIPTION OF THE PROJECT**

The following are the main characteristics of the works to execute at the Police Base, located at Santa Marta, Magdalena.

The works include among others the construction of a roof cover metallic structure with concrete foundation and structure, chain link fence and thermo-acoustic roof tiles. The works include the execution of the works and activities necessary for the lighting protection and grounding system for the metallic structure, as well as the obstruction lights.

It is clear that the Contractor shall verify the measures and get familiar with the terrain and the existing conditions before sending his quotation. In this statement of work, guide measures are given for the contractor to check the drawings, the construction quantities chart and to check the physical conditions on site. In no way this figures compromise the US Government to pay additional quantities if the resulting measures on site vary from the information given by the US Government.

For the structural, metallic and protection installations, the Contractor shall supply a maintenance and inspection manual, for routine activities, with recommendations for the inspection and maintenance after storms of severe load conditions.

### **DETAILED DESCRIPTION OF THE PROJECT**

#### **1) PRELIMINAR ACTIVITIES**

The Contractor shall make the applicable verifications in order to certify the designs given to them to be adequate for this installation and shall guarantee the correct execution of the works, fulfilling the standards of the applicable codes before the start of the construction process.

All works are to be constructed pursuant to the NEC, ACODAL, ICONTEC, EIA, AISC and NSR-10 and each shall be applied according to the necessity. The Contractor shall guarantee that the project fulfill all the rules of the Ministerio del Medio Ambiente and the Departamento Administrativo de la Aeronáutica Civil.

#### **1.01) Provisional installations**

The Contractor shall submit a drawing with location of the camp, fencing of the construction site and temporary services (water, energy, telephone, etc.), before starting its installation, for the approval of the US Government representative. All the installations shall be removed by the Contractor with the approval of the US Government representative when the works are finished. The site shall be left as it was found before the start of the constructions, with grass, sidewalks, etc. This removal, along with the installation shall be quoted at a global price and shall be included in the total cost of the project.

Provisional services: the eventual supply of any service by the final user to the Contractor shall not be a conditioned help and its eventual suspension shall not give place to any claim by the Contractor. The Contractor shall provide alternative services for these situations.

### **1.02) Security of the construction site**

The Contractor shall supply the services of security of the construction site and the camps. The US Government representative and the final user shall not be responsible for the payment of the security services nor for the elements left at the construction site.

### **1.03) Provisional fencing**

The work site shall be completely isolated from zones or roads surrounding the same. Similarly, if a materials storage area is built, this shall be fenced off in the same manner. The Contractor shall build a fence for this purpose, consisting of synthetic canvas with wooden posts every two meters, kept taut by means of wires at the top, middle and bottom. The Contractor shall fit props at either side of the access door or whenever there is a change of direction. This fence shall have one access point only, a double door through which machinery, vehicles and personnel shall enter. While the works are in progress, the contractor shall ensure that the fence is maintained and repaired, so that it is always in suitable condition.

### **1.04) Location and layout**

The Contractor shall use precision topographical instruments and following the architectural and structural distribution. The Contractor shall draw up the ground plan for each of the elements to be constructed. The area to be constructed is that indicated in the plans, plus the extra widths and the utilities connections. This work shall be done by a qualified professional, who shall determine the levels in addition to the ground plan. Everything shall be bench-marked on securely anchored wooden bridges.

The contractor shall supply all materials required to establish the planimetric and altimetric benchmarks, such as stakes and field books, etc. The US government representative shall review the location of the axes, but this does not exonerate the contractor from his responsibility for errors in locating or leveling any portion of the work. Prior to locating and laying out the work, the necessary datum or tie points, both horizontal and vertical, as well as the boundaries of the terrain to be occupied shall be defined and approved.

The temporary BM and reference axes shall be placed at sites where they do not interfere with the execution of the work and that does not need to be moved, in order to allow their subsequent control at any point during the course of the work. No marks made with paint of any type, scratches, nails, centering, etc. shall be permitted on any current building or structure. Once the layout is complete, the contractor shall submit a scheme for approval, including the location of existing structures and vegetation.

### **1.05) Existing facilities demolition:**

The Contractor shall demolish and remove the existing concrete slab structure area in which the roof cover concrete foundation will be located and built.

The contractor shall be responsible for any damage caused by the debris while they are being withdrawn. The works include demolition tools and transportation in trucks of the debris to authorized sites.

## **2.01) Foundation and Concrete Structures**

### **2.01.01) Excavation**

The Contractor shall excavate and remove the remnant material until the adequate depth for the location of the foundation elements for the roof cover metallic structure according with the project drawings (See drawings).

The contractor shall do the excavations needed to execute the works and shall be prepared to excavate in any type of material, using the appropriate methods, equipment and tools. Prior to start with the excavation, the contractor shall perform a survey of all aerial, surface or underground interference, in order not to damage pipes, boxes, wiring, posts, hoses, wells or other elements or structures existing in the work area or adjacent to it. Should the excavation interfere with sewers or pipes, the contractor shall build adequate support or protection for these installations.

The depth of the excavations and fills shall vary according to the works to be executed and the studies done by the Contractor. The excavated material shall not be stored in the top of the excavation. It will be lifted immediately to the trucks and transported to an authorized dump located outside the base if it is required.

The contractor shall post signs (warning signals) and provisional fencing at all excavation sites. The fencing shall consist of three yellow plastic tape eight (8) centimeters wide and supported by temporary sleepers fastened securely to the ground, placed in order to avoid accidents. To prevent their obstruction or damage, the contractor shall keep clear all drains, caps and catch pits in public utility networks near excavation sites.

The contractor shall be responsible of any over excavation caused by a cave-in, deficiency of the material existing in the zone or other reasons, who shall fill at his cost the over excavation with granular material previously approved, until the excavation has the required section.

The material removed from the excavation shall be removed as indicated in the general cleaning items. The contractors shall be responsible of the conduction of surface water and the evacuation of underground water and any other type of water, as well as the supply and maintenance of drainage or pumping systems required to stabilize the slopes and avoid water getting into the excavations.

#### **2.01.02) Compacting of the foundation level**

The Contractor shall compact the bottom level of the foundation for the construction of the concrete foundation of the metallic structure for the roof cover.

The Contractor shall the bottom of the excavations in all the areas to build before initiating the filling activities, using mechanical and/or manual equipment. The selection of the compacting equipment shall be approved by the US government Representative and the Contractor shall adjust to the plasticity characteristics of the material to be compacted.

If during the compaction process the bearing layers show faults or bland zones, these shall be replaced on time with excavations and fillings by the Contractor at its own cost.

#### **2.01.03) Filling in compacted granular material**

The Contractor shall supply, install and compact the base in selected granular material that shall be the support for the concrete foundation of the metallic structure for the roof cover according with the drawings of the project.

The Contractor shall supply all the labor, materials, equipment and the execution of all the necessary works for the installation of the compacted filling material required by the project. The thickness of the fill shall vary according with the area of the foundation, for each of the works. Before initiating the filling works, the Contractor shall verify that the base material is totally clean of any vegetation, organic material

and residual material from the construction and that the surfaces shall not have any inundation or zones with stagnant water.

The filling materials shall be obtained from sources authorized by current applicable environmental standards and by the Law, selected by the Contractor and approved by the US government Representative. At least 7 days before initiating the filling materials works, the contractor shall submit to the US Government the information on the sources of materials and shall submit all the working permits, the representative samples and the results of laboratory tests. The supply of the samples and the laboratory tests by the Contractor shall not represent additional cost to the US Government.

The filling material shall be constituted by sandy granular material without organic lime, vegetal material, residues, waste or debris. The maximum size of the material shall not exceed five (5) centimeters. The fines content (percentage passing sieve No. 200) shall be inferior to 20% and the plasticity index of the material passing sieve # 40 shall be lower than 6%. The filling material shall be compacted in symmetric layers of ten (10) centimeters and 95% of the density shall be obtained with the compaction test of the Modified Proctor. The methods and equipment of compaction shall have the approval of the US government Representative.

#### **2.01.04) Concrete foundation**

The Contractor shall supply the manual labor, materials and equipment, and the execution of all the works necessary for the construction of the foundation for the metallic structure for the roof cover which consists in concrete footing and pedestals, concrete tie beams and sub-floor concrete slab. Before initiating the construction of the foundation, the Contractor shall verify that the construction site is free from vegetation and construction materials and that the surfaces do not have inundated zones or zones with stagnant water. The bases shall be leveled before pouring the concrete.

The Contractor shall build the foundation structures in accordance with the NSR-10 and the recommendations of the soils study. The concretes shall have a strength  $f'_c$  of minimum 4000 psi (280 kg/cm<sup>2</sup>), which shall be certified by the Contractor using test cylinders that he will take following the applicable standards. The re-bar for the foundation shall be  $F_y = 60,000$  psi (4,200 Kg/cm<sup>2</sup>) for  $\varnothing > 3/8$ -inch and  $F_y = 34,000$  psi (2,400 Kg/cm<sup>2</sup>) for  $\varnothing 1/4$ -inch. The contractor shall follow the parameters of the design supplied by the US Government.

The Contractor shall supply the formwork, transportation and installation of the concrete for the footing and pedestal as well as for the concrete tie beams and sub-floor slab including the reinforcement steel specified on the structural design.

Contractor shall include the execution of the corresponding laboratory tests as required. The Contractor shall take 6 sample cylinders for concrete resistance tests per pouring or per each 5 m<sup>3</sup>, in order to test 2 cylinders at 7 days, 2 cylinders at 28 days and leave 2 cylinders as proof samples. The results of the laboratory tests shall be given at the right time to the US Government Representative.

#### **3.01) Steel Structure**

The Contractor shall supply and install all the metallic elements in accordance with the drawings and the parameters of the design supplied by the US Government, including all the elements and accessories necessary for its fabrication, assembly and installation. The metallic elements refer to the metallic columns, beams, support structures, and roof support structures. Before the construction of the metallic structures, the Contractor shall verify the design supplied by the US Government, the shop and construction drawings, and the description of all the fabrication and assembly system, characteristics of bolts and welding, steel qualities, painting, etc. If it is found that in the design some changes shall be done

in order to fulfill the standards, this changes shall be taken into account in the proposal. This way when executing the project, this shall be done in total accordance with the current standards.

The main design standards are the EIA-222F, the code AISC and the standard NSR-10. The design should also fulfill the following minimum specifications for the structural elements:

- The struts, diagonals and steps which are high resistance steel shall comply with the ASTM A572 Grade 50, with a leverage point of 50,000 psi or 350 Mpa.
- The brackets and union metal plates which are normal resistance steel shall comply with ASTM A36 with a leverage point of 36,000 psi or 250 Mpa.
- The nuts and bolts shall comply with the ASTM A394 and ASTM A A563.
- The anchor bolts shall be SAE 1020 normalize.
- The structural elements shall be galvanized in heat by immersion according to the standard ASTM-A123.

Before beginning with the fabrication of the structural elements, the contractor shall deliver the quality certificates of the elements in order to guarantee compliance of the specifications; otherwise the contractor shall perform mechanical and chemical tests as described on the ASTM A370 and the A-6 designation of the ASTM.

The Contractor shall fabricate the metallic elements following the design supplied by the US Government, the shop and construction drawings as well as the actual edition of the AISC and the NSR-10.

The welding works and materials shall comply with the AWS D1.0 as described on the design supplied by the US Government. The contractor shall follow the welding requirements described on the shop and construction drawings.

The US government representative shall inspect the fabrication and welding at the workshop, before approving the material to be transported to the project site. Any defect or correction to the steel structure or the welding works detected during the inspection shall be corrected by the contractor with no additional cost to the US Government.

A sample of all the metallic elements for the roof cover shall be assembled on the workshop before being transported to the project site. These elements shall be chosen randomly and the adjustment of the parts shall be verified by the US government representative along with the contractor representative. Any defect or correction to the metallic elements detected during the inspection shall be corrected by the contractor with no additional cost to the US Government.

The Contractor shall perform the application of the protection coating, epoxy base and paint for the elements of the structure following the procedures described on the design supplied by the US Government. The metallic coating for protection shall be alloy between galvanize and aluminum in a 95% - 5% proportion or as suggested by the contractor based on quality standards. The metallic elements shall be painted using base primer epoxy "Barrera epoxica" type with a minimum dry paint thickness between 1.5-2.0 mils. And the finishing paint shall be "Esmalte Uretano" type with a green or white color for the metallic elements or as approved by the CNP and the US government representative with a minimum thickness of 2.0 mils. These paintings shall be applied with compressor, for aggressive atmospheric conditions.

The metallic structure for the roof cover shall have enough resistance to support the operations required by the Counter-Narcotics Police. The construction of the metallic structure for the roof cover shall include

the aligning for the correct verticality and the implementation of quality standards. All safety measures shall be considered for the installation.

After the metallic elements are assembled, the surface will be cleaned with tow cloth, in order to eliminate residues of grease, dust or humidity.

### **3.02) Chain Link Fence and access door**

The contractor shall supply and install a galvanized chain link fences for the areas assigned in the attached architectural drawings. This fence is to enclose three sides of the metallic structure of the roof cover and to leave a vehicle access door in the other side for the Bus entry. The Contractor shall install the fence in 1½" x 1 ½" hollow caliber 10 chain link. The fence shall have the height from the bottom to the roof of the metallic structure where this shall be installed. The Contractor shall supply and install a frame for the chain link fence in a 2" x 1/8" angle, secured by a 1 ½" x 1/8" steel plate on all four sides, in order to avoid from it coming loose. The Contractor shall protect the angles with anticorrosive paint and with finishing paint.

The chain link support poles shall be in 2" diameter galvanized pipe with a steel plate at both ends of the pipe. The poles shall be anchored to the concrete tie beam through the steel plate as shown in the drawings. The Contractor shall take into account that the materials and paint needs be done for a highly saline area. The Contractor shall include the access doors for the fence with the same characteristics and with a lock support.

### **3.03) Roof Tiles Thermo - acoustic Type, trapezoidal shape**

The Contractor shall supply and install roof tiles thermo-acoustic type trapezoidal shape. The roof tiles item refers to the covering of the training platforms as shown in the attached architectural drawings. The roof tile shall be in galvanized steel sheets covered on both sides with treated asphalt and modify with polimerers to avoid crystallizations, and shall have a final finish with a covering of aluminum foil with zero porosity and covered with a coat of monopigmented paint protected by anti-stain lacquer.

The Contractor shall install the roof tiles over the metallic structure described on item 3.01 and as shown in the attached structural drawings. The Contractor shall fix the roof tiles in the lower part of the structure with galvanized screws with hexagonal head, conic metallic washer and a neoprene sealant washer. The Contractor shall consider roof tiles Ajoover brand or equivalent. The contractor shall have special care not to damage the roof tiles during the transportation and installation processes, and repairs or replacement shall be foreseen.

## **4) GENERAL ELECTRIC INSTALLATIONS**

Any electrical installation which is done by the contractor shall comply with the following electrical standards: NTC 2050 last upgrade and chapters 1,2,3,4 and section 645, NEC 250 last upgrade, NTC 3471/UL 67, EIA/TIA 607, EIA/TIA 568-569 last upgrade, ANSI/IEEE C62.41-C62.45, NEPA 780, NTC 4552, IEEE-80, IEEE-77 and RETIE last upgrade. The contractor shall include in his proposal catalogs and technical sheets of materials, parts and elements to be used in the project. The awarded contractor shall also count with an electrical/electronics engineer, who shall manage and control the execution of the electrical and communication work, the proposed electrical/electronics engineer shall also sign the installation conformity and material conformity acts requested on RETIE. The contractor shall include in his proposal the curriculum vitae of the proposed engineer.

### **IMPORTANT**

**The required civil work for the underground raceway system and electrical installation in general, shall include the costs for repairing the affected areas during the project execution (e.g. Sidewalks, pavements, green areas and concretes, painting, sleeves, among others). The awarded contractor shall comply with civil and electrical Colombian Constructions standards even if the affected areas do not meet them. The bidder shall submit catalogs and technical spread sheets for all the materials to be used during the construction project. Lack of information and omission of such data shall consider the proposal as invalid and shall not be taken into the awarding process.**

The electrical works for the rappel tower shall include the following items:

#### **4.01) Grounding system**

The contractor shall supply and install a grounding system, such as requested on this item. The system shall be composed of four grounding electrodes, which shall be placed such as shown in drawing E1. The grounding electrodes shall have inspection enclosures, which shall be built as shown. The free space between cover and viewable ending of the grounding electrode shall be at least 60cms. The system is expected to have less than 2 ohms impedance value.

In case that soil conditions were not proper to get the expected impedance value, the Contractor shall include in his proposal the soil study, in order to recommend a soil treatment, which shall be required to improve the soil conditions. The awarded contractor shall certify the system by the following sheet:

- Impedance value according to IEE 142-4.1.2
- Electrodes material NEC 250-52-c (2)
- Electrodes size and diameter NEC 250-52-c (3)
- Electrodes separation NEC 250-56
- Connection quality NEC 250-70
- Conductor's gauge network NEC 250-50 (d)
- Conductor's gauge for grounding NEC 250-66C
- Conductor qualities NEC 250-50
- Low power interconnection NEC 250-68
- Electrodes accessibility NEC 250-68
- Grounding barrage EI/TIA 607-5.4
- Flowing current IEEE 1100 table 4.3

The electrodes shall be caliber 5/8'', 2.44 length, copper 99%. The grounding line shall be made in copper conductor caliber AWG #1/0. Drawing E1 shows the grounding location and installation. Note: The electrodes' inspection enclosures shall contain a soil treatment such as Favigel or Hidrosolta, in order to improve soil conductivity and homogeneity features. As an example, Figure No.1 shows a typical inspection box required for previous projects.



## Figure No.1

### 4.01.01) Lightning protection system (Exterior)

The contractor shall supply and install a Lightning Protection System (LPS), which shall be composed of one aerial terminal Franklin blunt type Ref P8, shown on Drawing E1. The air terminal shall be coupled with a copper pole 300 cm length with screw-socket, which shall be place according to drawing E1. The aerial terminal to be supplied and installed shall comply with standard UL 96A, NFPA 780. The air terminal and the copper pole shall be placed over the top roof ridge, which shall be connecting by two line downs (THHN/THWN cooper feeder caliber AWG No. 1/0), such as shown on drawing E1. Holders and isolators shall be supplied by the Contractor. Grounding line shall be separated 10 cm from the surface's structure. The line-down shall be canalized by means of a galvanized duct  $\frac{3}{4}$  inch, which shall be placed along the structure, holding it by metallic anchors that shall separate each of the line downs 10 cm from the structure. The piping system shall also be grounded by using grounding kits. The line down will end in a grounding system, which shall be connected with the tower's grounding system.

The plans listed below are attached.

1. Structural (Drawings S-01 and S-02)
2. Electricals (E-001)

**NOTE:** The contractor to whom the project is awarded shall have to present catalogues and test results of all materials to use for this project.

### 5.01) Other Requirements:

**5.01.01) List of Personnel:** Prior to initiation of the work, a list of personnel to be employed at the site shall be submitted for review to be able to obtain access to work area, including full names, identification card numbers, place and date of birth, home address and, in some cases, a government valid certificate of good conduct and photographs. The US Government and the Base shall reserve the right to admit or withdraw personnel from the work site for reasons of security and/or due to the quality of the work.

**5.01.02) Vehicles and Machinery:** All vehicles and machinery or equipment that would schedule to enter the work area shall be itemized on a list submitted well enough in advance to be verified and to obtain an entry permit. This list shall include type of vehicle, plates, complete name and ID number and place of issue of the driver. The contractor shall take into account the time used by vehicles and personnel in order to enter and exit the work area.

**5.01.03) Industrial Safety Person:** The contractor shall have permanently on site a specialized person in industrial security that will be dedicated to foresee that the workers are constantly complying with the security standards of personnel and equipment, scaffolds and other installations or structures.

**5.01.04) Apparel:** All personnel shall be equipped with an overall of the same design and color, or long pants and T-shirt with sleeves of the same type and color, boots, hardhats, gloves and any security elements required for their particular activity, such as face masks or shields, gloves, boots, ear plugs, etc.

Use of these items at the work site is mandatory. Likewise, each employee shall wear a laminated recent photo identity card indicating his/her name and identification card number, position, and contractor name.

**5.01.05) Cleaning and Debris Removal:** The contractor shall keep personnel cleaning the construction site and nearby zones daily. The unit prices for all items, without exception, include the costs of cleaning up, loading and removal of all materials resulting from the building work. The contractor will take these materials to an authorized dump, where the interests of the base, third parties and the environment will not be affected (the contractor shall follow the parameters established in Resolution 541/94 and the subsequent that modify it). Material from excavations shall be deposited in such a way as to avoid blocking the entrance to the site at all times or occupying public roads while the material is being loaded into trucks for removal.

**5.01.06) Materials and Finishes:** The contractor shall include new materials and of first quality design for prolong use and heavy duty. The contractor shall assure good materials and excellent finishes. All the colors and finishes shall be submitted to the US Government representative for approval prior to purchase and installation.

The contractor shall leave on site a stock of materials like bulbs, fuses, terminals or pipes that have been fitted, representing three (3) % of the total quantity, for future maintenance purposes. These items shall be handed over duly packed, identified and listed.

**5.01.07) Food, Transportation and Lodging:** The contractor is responsible for food and lodging for personnel off Base.

**5.01.08) Information of Important Events:** The contractor shall inform the Contracting Officer's Representative of special events or works, such as the pouring of concrete, tests and the like, giving the Contracting Officer's Representative at least seventy two (72) hours notice so he/she can be physically present.

**5.01.09) Site Description:** The contractor before beginning preliminary works shall complete a site description with photographs and an account of the actual conditions of roads, sidewalks, surrounding buildings, etc., this report shall be signed by the commander and contractor. This report is for the purpose documenting the actual status of the area before the work is performed. This report will be used to compare the site after the work is finished. Three identical copies must be furnished: one for the user (Colombian National Police), one for the contractor, and the other one for the US Government. If the Contractor caused any damage to the work site or other private or public property he/she shall do all the repairs prior to the contract closeout; these repairs are without cost to the US Government. At the end of the projects a closing review and memorandum should be done with the participants, a signed copy shall be furnished in the final report.

**5.01.10) Inventory of Removed Elements:** The contractor shall dismount, list, and submit the reusable elements of the work site to the final user (Colombian National Police). A signed copy of this list shall be given to the user and the Contracting Officer's Representative.

**5.01.11) Protection of Elements in the Work Area:** Areas, equipment, and elements at the work site or in areas nearby shall be protected from damage or deterioration. The contractor shall assume the cost of any repair or replacement required because of improper use or carelessness on his part or on the part of his workers.

**5.01.12) Security of the Construction Site:** The Contractor shall supply the services of security of the construction site and the camps. The US Government and the final user will not be responsible for the payment of the security services nor for the elements left at the construction site.

**5.01.13) Nearby Zones:** The nearby zones must be left in the same conditions previous to the construction or in better conditions (with grass, gravel, sidewalk, floor finishes or whatever applies in each case). Furthermore, repairs shall be done to faults, scratches, damage and anything else which the contractor and the US Government might note in the building and neighboring constructions for ensuring that the work is made ready and handed over correctly. The contractor shall disassemble and remove all preliminary facilities, camps, sites, etc. before the final handover, eliminating all debris and extra materials.

**5.01.14) Underground Interferences Study:** The contractor shall have on hand a study of all aerial, surface, underground or engaged interferences provided by the CNP, so as not to damage pipes, boxes, wiring, posts, hoses, wells or other elements or structures existing in the work area or adjacent to it. Should the excavation interfere with sewers or pipes, the contractor shall build adequate support or protection for these installations and/or develop a new route, subject to prior approval by the US Government Representative. The contractor shall keep all drains caps and catch pits clear in public utility networks near excavation sites to prevent their obstruction or damage.